

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 July 2004 (08.07.2004)

PCT

(10) International Publication Number
WO 2004/056474 A1

(51) International Patent Classification⁷: **B01J 27/188.** (54) Agents: AOKI, Atsushi et al.: A. AOKI, ISHIIDA & ASSOCIATES, Toranomon 37 Mori Bldg., 5-1, Toranomon 3-chome, Minato-ku, Tokyo 105-8423 (JP).

C07C 67/00, B01J 23/60

(21) International Application Number:
PCT/JP2003/015186

(22) International Filing Date:
27 November 2003 (27.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
NO.2002-369424 20 December 2002 (20.12.2002) JP
60/436,633 30 December 2002 (30.12.2002) US

(71) Applicant (for all designated States except US): SHOWA DENKO K. K. [JP/JP]; 13-9, Shiba Daimon 1-chome, Minato-ku, Tokyo 105-8518 (JP).

(72) Inventor; and
(75) Inventor/Applicant (for US only): SAKAI, Masaaki [JP/JP]; C/O OITA PLANT, SHOWA DENKO K.K., 2, Oaza Nakanosu, Oita-shi, Oita 870-0189 (JP).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: HETEROPOLYACID AND/OR ITS SALT SUPPORTED CATALYST, PRODUCTION PROCESS OF THE CATALYST AND PRODUCTION PROCESS OF COMPOUND USING THE CATALYST

(57) **Abstract:** A supported catalyst comprising a support having supported thereon at least one member selected from the group consisting of heteropolyacids and heteropolyacid salts, in which the heteropolyacid and/or heteropolyacid salt is substantially present in a surface layer region of the support to a depth of 30% from the support surface. The catalyst has a high performance when used for the production of compounds by various reactions.

WO 2004/056474 A1

